

10/542890

JC14 Rec'd PCT/PTO 20 JUL 2005

AMENDMENT

(Amendment according to provision of Section 11)

To Ms. Eiko Shigeta, Examiner of the Patent Office

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1. Indication of International Application

PCT/JP2004/000401

10 2. Applicant

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4. Object of amendment claims

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5. Contents of amendment

Claims, page 25, line 16, "composition" has been amended to
"catalyst composition for a telomerization reaction of a
30 conjugated diene compound and an alcohol".

6. List of the annexed document

New substitute sheet of claims, pages 25 and 25/1

(English version page 29) One copy

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Claims

1. (amended) A catalyst composition for a telomerization reaction of a conjugated diene compound and an alcohol, which
5 comprises a palladium compound, an isocyanide represented by the formula (I)



wherein R^1 , R^2 and R^3 are the same or different and each is an optionally substituted alkyl group, an optionally substituted
10 alkenyl group, an optionally substituted aryl group or an optionally substituted aralkyl group, or two of them
optionally form a cycloalkyl group together with a carbon atom bonded thereto,

and a base represented by the formula (II)



wherein M is an alkali metal, an alkaline earth metal or an onium, R^4 is a hydrogen atom, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted aryl group or an optionally substituted aralkyl group, when M is an alkali metal or an onium, then n is 1,
20 and when M is an alkaline earth metal, then n is 2.

2. The composition of claim 1, wherein the palladium compound is a divalent palladium salt.

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3. The composition of claim 1, wherein the isocyanide is selected from t-butylisocyanide, 1,1-dimethylpropylisocyanide and 1,1,3,3-tetramethylbutylisocyanide.

30 4. The composition of claim 1, wherein the composition ratio of the isocyanide is within the range of 0.1 - 50 equivalents relative to the palladium compound.

5. The composition of claim 4, wherein the composition

RESPONSE

To Ms. Eiko Shigeta, Examiner of the Patent Office

5 1. Indication of International Application

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4. Date of Notice 20.04.2004

25 5. Contents of response

(1) In the Written Opinion dated April 20, 2004 (mailing date),
the Examiner cites the following Reference 1 cited in the
international Search Report and holds that claims 1-8 of this
30 application lack novelty and inventive step over Reference 1.
Reference 1: US 5886211 A1 (Sagami Chemical Research Center)
1999.03.23

The reasons therefor are as follows.

35 Claim 1 lacks novelty over Reference 1.

Reference 1 describes, at column 6, line 14 - column 7,
line 55, a composition containing a palladium compound, a
supporting ligand and a base, and recites isocyanides as the
supporting ligand.

40 Claim 2 lacks novelty over Reference 1.

Reference 1 recites, at column 6, lines 14-62, divalent

palladium salt as the palladium compound.

Claim 3 lacks novelty over Reference 1.

Reference 1 recites, at column 7, lines 15-34, t-butylisocyanide as the isocyanides.

5 Claims 4, 5, 7 and 8 lack novelty over Reference 1.

In the invention described in Reference 1, too, the composition ratio of the isocyanides and the base relative to the palladium compound is considered to be of the same level as that in the present invention (column 6, line 14 - column 10 7, line 55).

Claim 6 lacks novelty over Reference 1.

In the invention described in Reference 1, too, similar bases as used in the present invention are used (column 7, lines 35-55).

15 Therefore, claims 1-8 lack novelty over Reference 1.

(2) The present invention

Claims 1-8 of the present invention as amended in the Amendment submitted separately are as follows.

20 "1. (amended) A catalyst composition for a telomerization reaction of a conjugated diene compound and an alcohol, which comprises a palladium compound, an isocyanide represented by the formula (I)



25 wherein R^1 , R^2 and R^3 are the same or different and each is an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted aryl group or an optionally substituted aralkyl group, or two of them optionally form a cycloalkyl group together with a carbon atom bonded thereto,

30 and a base represented by the formula (II)



wherein M is an alkali metal, an alkaline earth metal or an

onium, R⁴ is a hydrogen atom, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted aryl group or an optionally substituted aralkyl group, when M is an alkali metal or an onium, then n is 1,
5 and when M is an alkaline earth metal, then n is 2.

2. The composition of claim 1, wherein the palladium compound is a divalent palladium salt.

3. The composition of claim 1, wherein the isocyanide is selected from t-butylisocyanide, 1,1-dimethylpropylisocyanide
10 and 1,1,3,3-tetramethylbutylisocyanide.

4. The composition of claim 1, wherein the composition ratio of the isocyanide is within the range of 0.1 - 50 equivalents relative to the palladium compound.

5. The composition of claim 4, wherein the composition ratio
15 of the isocyanide is within the range of 1 - 20 equivalents relative to the palladium compound.

6. The composition of claim 1, wherein the base is selected from lithium hydroxide, lithium methoxide, sodium hydroxide, sodium methoxide, sodium isopropoxide,
20 sodium s-butoxide, sodium phenoxide, sodium benzyloxide, potassium hydroxide, potassium methoxide, potassium ethoxide, potassium isopropoxide, potassium s-butoxide, potassium t-butoxide, potassium phenoxide, potassium benzyloxide, rubidium hydroxide, cesium hydroxide,
25 calcium hydroxide, strontium hydroxide, barium hydroxide, tetramethylammonium hydroxide, tetramethylammonium methoxide, tetramethylammonium phenoxide, tetramethylammonium benzyloxide, tetrabutylammonium hydroxide, benzyltrimethylammonium
30 hydroxide, trimethylsulfonium hydroxide, tetraphenylphosphonium hydroxide and trimethyloxonium hydroxide.

7. The composition of claim 1, wherein the composition ratio

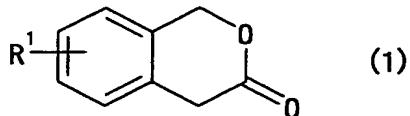
of the base is within the range of 0.1-100000 equivalents relative to the palladium compound.

8. The composition of claim 7, wherein the composition ratio of the base is within the range of 1-10000 equivalents relative to the palladium compound."

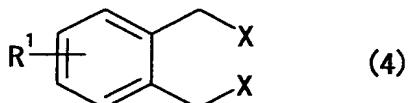
By the above-mentioned amendments, it has been clarified that the composition of claims 1-8 of the present invention is a catalyst composition for a telomerization reaction of a conjugated diene compound and alcohols.

10 (3) Comparison between the present invention and the invention of cited reference

Reference 1 describes a production method of 3-isochromanone represented by the formula (1)



15 wherein R¹ is a hydrogen atom, a halogen atom, an alkyl group having 1 to 6 carbon atoms or an alkyloxy group having 1 to 6 carbon atoms, which comprises reacting an α,α'-oxylenedihalide derivative represented by the formula (4)



20 wherein R¹ is as defined above and X is a halogen atom, with carbon monoxide and water in the presence of a hydrogen halide scavenger and a catalyst, and then treating the derivative with an acid. Reference 1 describes that a palladium catalyst can be used as the catalyst and
25 isocyanides can be added as the supporting ligand, and recites t-butylisocyanide as an example of the isocyanides. Reference 1 describes an alkali metal inorganic base and an alkaline earth metal inorganic base as hydrogen halide scavengers.

The catalyst composition described in Reference 1 is used for the reaction for producing 3-isochromanone from an α,α' -o-xylene dihalide derivative, and is different from the "catalyst composition for a telomerization reaction of a conjugated diene compound and alcohols" described in claims 1-8 of the present invention in the reaction it catalyzes.

Reference 1 does not describe use of a catalyst composition for such telomerization reaction, and does not suggest use of a catalyst composition for a telomerization reaction.

The catalyst composition of the present invention affords effects characteristic of a telomerization reaction when used as a catalyst of a telomerization reaction, in that an ether product can be produced with high terminal-position selectivity (straight chain selectivity), the selectivity of the telomerization reaction is high, the amount of the byproduct other than ethers is small, and further, that the conversion rate of the conjugated diene compound is high. Such effects characteristic of the telomerization reaction by the catalyst composition of the present invention cannot be easily envisaged by those of ordinary skill in the art based on Reference 1 relating to the production method of 3-isochromanone, which is different from the telomerization reaction.

(4) Conclusion

As described in detail in the above, the invention described in claims 1-8 of the present invention is not the invention described in Reference 1 and cannot be easily conceived by those of ordinary skill in the art from the invention described in Reference 1.

Therefore, we believe that the invention described in claims 1-8 of the present invention has novelty and inventive step.